

09/25/98  
1c560 U.S. PTO

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PTO/SB/05 (4/98)  
Approved for use through 09/30/2000. OMB 0651-0032  
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE  
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# UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No. 74047  
First Inventor or Application Identifier Bruce A. Scheffer  
Title METHOD AND APPARATUS FOR EFFECTING  
SHINGLING OF CONVEYED PRINTED PRODUCTS  
Express Mail Label No. EM509547849US

## APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

- ☒ \* Fee Transmittal Form (e.g., PTO/SB/17)  
(Submit an original and a duplicate for fee processing)
- ☒ Specification [Total Pages 21]  
(preferred arrangement set forth below)
  - Descriptive title of the Invention
  - Cross References to Related Applications
  - Statement Regarding Fed sponsored R & D
  - Reference to Microfiche Appendix
  - Background of the Invention
  - Brief Summary of the Invention
  - Brief Description of the Drawings (if filed)
  - Detailed Description
  - Claim(s)
  - Abstract of the Disclosure
- ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 5]
- Oath or Declaration [Total Pages 3]
  - ☐ Newly executed (original or copy)
  - ☒ Copy from a prior application (37 C.F.R. § 1.63(d))  
(for continuation/divisional with Box 16 completed)
    - ☐ DELETION OF INVENTOR(S)  
Signed statement attached deleting  
inventor(s) named in the prior application,  
see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

\* NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY  
FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT  
IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

ADDRESS TO: Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 20231

- ☐ Microfiche Computer Program (Appendix)
- Nucleotide and/or Amino Acid Sequence Submission  
(if applicable, all necessary)
  - ☐ Computer Readable Copy
  - ☐ Paper Copy (identical to computer copy)
  - ☐ Statement verifying identity of above copy

## ACCOMPANYING APPLICATION PARTS

- ☐ Assignment Papers (cover sheet & document(s))
- ☐ 37 C.F.R. § 3.73(b) Statement of Power of Attorney  
(when there is an assignee) ☒
- ☐ English Translation Document (if applicable)
- ☒ Information Disclosure Statement (IDS)/PTO-1449 ☒ Copies of IDS Citations
- ☒ Preliminary Amendment
- ☒ Return Receipt Postcard (MPEP 503)  
(Should be specifically itemized)
- ☐ \* Small Entity Statement(s) ☒ Statement filed in prior application,  
(PTO/SB/09-12) Status still proper and desired
- ☐ Certified Copy of Priority Document(s)  
(if foreign priority is claimed)
- ☒ Other: Petition to Make Special

16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment:

☐ Continuation ☒ Divisional ☐ Continuation-in-part (CIP) of prior application No: 08 / 496,822  
Prior application information: Examiner Charles Goodman Group / Art Unit: 3724

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

## 17. CORRESPONDENCE ADDRESS

☐ Customer Number or Bar Code Label

or ☒ Correspondence address below

(Insert Customer No. or Attach bar code label here)

Name	Richard L. Wood, Esq.				
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Name (Print/Type)	Richard L. Wood, Esq.	Registration No. (Attorney/Agent)	22,839
Signature	Richard L. Wood	Date	9/25/98

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231.

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**FEE TRANSMITTAL**Note: Effective October 1, 1997.  
Patent fees are subject to annual revision.**TOTAL AMOUNT OF PAYMENT (\$)** 730.00**Complete if Known**

Application Number	
Filing Date	Sep. 25, 1998
First Named Inventor	Bruce A. Scheffer
Group Art Unit	3724
Examiner Name	Charles Goodman
Attorney Docket Number	74047

**METHOD OF PAYMENT (check one)**

- 1.
- ☒
- The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit  
Account  
Number  
Deposit  
Account  
Name

23-0920

Welsh &amp; Katz, Ltd.

- ☒
- Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17
- ☐
- Charge the Issue Fee Set in 37 CFR 1.18 at the Mailing of the Notice of Allowance

- 2.
- ☒
- Payment Enclosed:
- 
- ☒
- Check
- ☐
- Money Order
- ☐
- Other

**FEE CALCULATION****1. FILING FEE**

Large Entity Fee Code	Small Entity Fee Code	Fee Description	Fee Paid
101 790	201 395	Utility filing fee	395.00
106 330	206 165	Design filing fee	
107 540	207 270	Plant filing fee	
108 790	208 395	Reissue filing fee	
114 150	214 75	Provisional filing fee	
<b>SUBTOTAL (1)</b>			<b>(\$)</b> 395.00

**2. CLAIMS**

Total Claims	Extra	Fee from below	Fee Paid
17	-20 = 0	X	
Independent Claims 8	-3 = 5	X	205.00
Multiple Dependent Claims 0		X	0

Large Entity Fee Code	Small Entity Fee Code	Fee Description
103 22	203 11	Claims in excess of 20
102 82	202 41	Independent claims in excess of 3
104 270	204 135	Multiple dependent claim
109 82	209 41	Reissue independent claims over original patent
110 22	210 11	Reissue claims in excess of 20 and over original patent
<b>SUBTOTAL (2)</b>		

**SUBTOTAL (2)** (\$)**3. ADDITIONAL FEES**

Large Entity Fee Code	Small Entity Fee Code	Fee Description	Fee Paid
105 130	205 65	Surcharge - late filing fee or oath	0
127 50	227 25	Surcharge - late provisional filing fee or cover sheet	0
139 130	139 130	Non-English specification	0
147 2,520	147 2,520	For filing a request for reexamination	0
112 920*	112 920*	Requesting publication of SIR prior to Examiner action	0
113 1,840*	113 1,840*	Requesting publication of SIR after Examiner action	0
115 110	215 55	Extension for reply within first month	0
116 400	216 200	Extension for reply within second month	0
117 950	217 475	Extension for reply within third month	0
118 1,510	218 755	Extension for reply within fourth month	0
128 2,060	228 1,030	Extension for reply within fifth month	0
119 310	219 155	Notice of Appeal	0
120 310	220 155	Filing a brief in support of an appeal	0
121 270	221 135	Request for oral hearing	0
138 1,510	138 1,510	Petition to institute a public use proceeding	0
140 110	240 55	Petition to revive - unavoidable	0
141 1,320	241 660	Petition to revive - unintentional	0
142 1,320	242 660	Utility issue fee (or reissue)	0
143 450	243 225	Design issue fee	0
144 670	244 335	Plant issue fee	0
122 130	122 130	Petitions to the Commissioner	130.00
123 50	123 50	Petitions related to provisional applications	0
126 240	126 240	Submission of Information Disclosure Stmt	0
581 40	581 40	Recording each patent assignment per property (times number of properties)	0
146 790	246 395	Filing a submission after final rejection (37 CFR 1.129(a))	0
149 790	249 395	For each additional invention to be examined (37 CFR 1.129(b))	0

Other fee (specify) \_\_\_\_\_

Other fee (specify) \_\_\_\_\_

\* Reduced by Basic Filing Fee Paid

**SUBTOTAL(3)** (\$)**SUBMITTED BY**

Typed or Printed Name: Richard L. Wood, Esq.

Signature: Richard L. Wood

Date: 9/25/98

**Complete (if applicable)**

Reg. Number: 22839

Deposit Account User ID

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Bruce A. Scheffer et al.

Group No.: 3724

Serial No.:

Examiner: Charles Goodman

Filed: September 25, 1998

For: METHOD AND APPARATUS FOR  
EFFECTING SHINGLING OF  
CONVEYED PRINTED PRODUCTS

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**Washington, DC 20231**, on this date:

9/25/98

Date

Express Mail No.

EM509547849US

Attorney

Docket No.: 74047

PETITION TO MAKE SPECIAL UNDER 37 C.F.R. § 1.102(d)

Box PATENT APPLICATION  
Assistant Commissioner for Patents  
Washington, DC 20231

Sir:

Applicants through their undersigned attorneys, hereby petition pursuant to 37 C.F.R. § 1.102(d) and MPEP § 108.02 (VIII) to make their above-identified divisional application, which is being filed simultaneously herewith, special.

A check in the amount of \$130.00 is enclosed to cover the Petition fee under 37 C.F.R. § 1.17(i) to make this application special. The Commissioner is hereby authorized to charge any additional fees which may be required, should the enclosed check be in the wrong amount or entirely missing or otherwise improper, or credit any overpayment, to Deposit Account No. 23-0920.

The claims as filed in the subject divisional application by way of a Preliminary Amendment are believed to be directed to a single invention. If the Office determines that all of the claims in the application are not directed to a single invention, applicants will make an election

without traverse as a prerequisite to the grant of special status.

Applicants submit that a pre-examination search in the PTO was made by applicants' undersigned attorney in Class 271, subclasses 182, 202 and 204, including the related foreign art located in the Examining Group search room. A later second patentability search was conducted in the PTO by applicants' undersigned attorney in Class 271, subclasses 182, 202 and 204, directed specifically to the subject matter defined in claims 7-22 set forth in applicants' Preliminary Amendment being filed in the subject divisional application. Prior art has also been cited by the PTO during prosecution of applicants' parent application

\* \* \* \*

Enclosed herewith are copies of the following listed patents that are presently known and believed to be most pertinent to the subject matter encompassed by applicants' claims 7-22. The listed patents are also identified in an Information Disclosure Statement (IDS) under 37 C.F.R. §§ 1.56, 1.98 and 1.99 that accompanies this Petition. Duplicate copies of the listed patents are not included with the IDS.

<u>U.S. Patent No.</u>	<u>Issue Date</u>	<u>Inventor(s)</u>
3,178,174	Apr. 13, 1965	Schneider
3,994,221	Nov. 30, 1976	Littleton
4,040,617	Aug. 9, 1977	Walkington
4,966,521	Oct. 30, 1990	Frye et al.
4,969,640	Nov. 13, 1990	Littleton
5,039,082	Aug. 13, 1991	Littleton
5,060,928	Oct. 29, 1991	Vits

<u>U.S. Patent No.</u>	<u>Issue Date</u>	<u>Inventor(s)</u>
5,143,368	Sep. 1, 1992	Kiyota et al.
5,249,791	Oct. 5, 1993	Belanger et al.
5,366,217	Nov. 22, 1994	Tokuno et al.
5,607,148	Mar. 4, 1997	Mack et al.

#### Detailed Discussion of the Prior Art Patents

U.S. Patent No. 4,966,521 (Frye et al.) discloses a tail stopping and knockdown device that uses a "tail-stopping device" comprising a top roll brush 24 and a slowly rotating roll 26. The roll 24 has brush members 32, 34 operative to engage the tail end of each successive sheet so as to exert sufficient pressure on an underlying sheet against the roll to cause the lower sheet to move into the stacking pile while the top sheet continues to sit on the unnipped-slow speed roll 26 waiting for the next nip of the brush member (Col. 2, line 52, to Col. 3, line 10).

U.S. Patent No. 4,969,640 (Littleton) discloses a sheet diverting system employing snubbing means for decelerating successive conveyed sheet products to facilitate overlapping or shingling of successive sheet products. The embodiments of FIGS. 9-11 employ a pair of "snubber arks" 125A, 127A fixed to a snubber shaft 131 (Col. 15, lines 54-65). The snubber support shaft 131 is driven at a ratio of 1 to 1 with respect to rotation of the rotary knife cylinder 19 (Col. 13, lines 60-63). Rotation of the snubber shaft is effective so that the snubber members depress incoming sheets against the low speed conveyor while the tail end of the next successive sheet is trapped between or has just immediately left the high speed conveyor belts 53 and 75 (Col. 14, lines 4-43).

U.S. Patent No. 3,994,221 (Littleton) discloses a sheeter that utilizes a knock-down arm 90 rotatably driven at a 1 to 1 ratio with the cutting cylinder so that the knock-down arm rotates once for each rotation of the cutting cylinder and acts once upon each sheet being fed through the machine. Means are provided for phasing the knock-down arm 90 so that it operates upon the tail end of each sheet being fed into the slow speed conveyor belt 50 (Col. 4, lines 27-41).

U.S. Patent No. 5,143,368 (Kiyota et al.) discloses a paper dodging device having a pair of upper and lower high-speed belts for feeding paper onto a low-speed belt with the upper high-speed belt being overlapped above the inlet side of the low-speed belt. A snubber 11 is disposed above the inlet side of the low-speed belt and has an outer diameter gradually increasing toward the rear side with respect to the rotational direction of the snubber so as to form paper dropping portions at the outer peripheral end of each increasing diameter for peeling the rear end of paper from the upper high-speed belt.

U.S. Patent No. 5,366,217 (Tokuno et al.) discloses a sheet stacker wherein sheets cut by a sheet cutter are conveyed into a stacking station by a conveyor with a fixed sheet interval. A pair of clamping devices 14a and 14b are operative to clamp the tail ends of cut sheets by means of rotating devices 32a having free rolls 30a that press the tail ends of cut sheets against a slowdown roll 28a, in the case of clamping device 14a, to equalize the speed of a cut sheet to the speed of the slowdown roll 28a. The clamping device 14b clamps the tail ends of cut sheets against a slowdown roll 28b to slow down each sheet to an optimum speed and send out the sheet to a second stacking zone 16b. This patent describes as prior art the device of FIG. 8 that employs a brush roll 103 having brushes 108 operative to press the tail ends of sheets against a low speed roll 104.

U.S. Patent No. 5,060,928 (Vits) discloses an apparatus for depositing sheets at a stacking station and having means for reducing the conveying speed of the sheets. The apparatus includes

two similar deflecting members 30, 31 that are spaced apart in the conveying direction and act, respectively, on a braking member 32 and a conveying member 33 arranged underneath the conveying plane. The deflecting members 30 and 31 consist of disks 36, 37, respectively, that are spaced apart on driven shafts 34, 35 and are fitted with segment-like brushes 38, 39, respectively. The brush 38 serves to press the end of a sheet 42 against the cylindrical jacket 41 to retard the speed of the sheet.

U.S. Patent No. 5,249,791 (Belanger et al.) discloses a fan delivery unit wherein a plurality of fan disks are arranged next to one another on a rotor shaft and have fan blades forming fan pockets therebetween. A device for braking printed products as they are fed into the fan pockets is provided that employs a plurality of brake rollers corresponding in number to the fan disks and which, in the embodiment illustrated in FIGS. 1-3b, employ brush segments 19a and 19b fastened onto brake rollers 18 so as to engage the trailing ends of printed products 30 for effecting braking as they enter the fan pockets.

U.S. Patent No. 5,607,148 (Mack et al.) discloses a device for removing copies diverted from a conveyed stream thereof and employs a rotating copy brake 15 having what appear to be brush type members operative to press copies 36 against suction tapes 16 decelerate movement of the copies 36 to be delivered into a main pile 19. A second upper copy brake 22 operates in a similar manner.

U.S. Patent No. 3,178,174 (Schneider) discloses an apparatus for overlapping sheets that, in the embodiment illustrated in FIGS. 5-7, employs a press-down component 19 which is driven by a rotating cross cutting means 3 so that the member 19 presses the rearward ends of sheets against underlying break bands 20.

U.S. Patent No. 4,040,617 (Walkington) discloses a sheet feeding apparatus wherein sheets fed between fast and slow conveyors have their trailing ends engaged by a dabber roller 15 that is rotated in synchronized relation with the sheet delivery on the high-speed conveyor so that the resiliently mounted rolling element nips the trailing portion of each sheet to the upstream roll of the slower speed conveyor and travels with the sheet, maintaining the nip, over and arch of rotation of the roller.

U.S. Patent No. 5,039,082 (Littleton) discloses an apparatus for decelerating and shingling a stream of regularly spaced apart sheets in a sheet processing system. Each sheet is subjected to a first plurality of snubber assemblies 123 each of which includes a snubber arch 125 operative to engage each sheet S substantially near its tail, thereby pressing the sheet onto an underlying slower speed conveyor belt to effect deceleration. The snubber arches 125 are rotated at approximately the same speed as the underlying belts 121. A deck plate 201 may be provided below the snubber to provide a solid platform against which the snubber arches 125 can trap the respective sheets S. A second deceleration and shingling system 220 is provided downstream from the snubbing means 123 to further decelerate each sheet S by means of a pair of snubber wheels 225 and 227 freely rotatable on snubber support plates 224. The snubber wheels 225 or 227 engage the tail end of an incoming sheet so as to press the sheet against the lower speed belts 229 thereby further decelerating the sheet.

None of the above- discussed patents teach or suggest a method or apparatus for shingling successive irregularly spaced sheet products cut by a rotary cutter from a continuous web of sheet material and wherein the irregularly spaced sheet products are caused to shingle as they pass from a first conveyor to a second slower speed conveyor by at least one knock-down wheel having a number of knock-down elements corresponding to the number of cutter knives on the rotary cutter




that establish the trailing edges of the irregularly spaced sheet products, the knock-down elements being angularly spaced about the knock-down wheel to correspond to the angular positions of the trailing edge cutting knife blades on the cutter and being rotated in phase relation with the cutter so that the tangential velocity of the outer ends of the knock-down elements is substantially equal to the tangential velocity of the cutting edges of the cutter knife blades, and the knock-down elements engage the trailing edges of the irregularly spaced products at substantially the same position relative to their trailing edges.

It is believed applicants' claims as presented in their accompanying divisional application patentably distinguish over the above discussed prior patents known to applicants, and expedited examination of applicants' divisional application is earnestly solicited.

Respectfully submitted,

WELSH & KATZ, LTD.

By   
Richard L. Wood  
Reg. No. 22,839

September 25, 1998  
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Bruce A. Scheffer et al.

Group No.: 3724

Serial No.:

Examiner: Charles Goodman

Filed: September 25, 1998

For: METHOD AND APPARATUS FOR  
EFFECTING SHINGLING OF  
CONVEYED PRINTED PRODUCTS

I hereby certify that this paper is being  
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as Express Mail in an envelope addressed to:  
**Assistant Commissioner for Patents,**  
**Washington, DC 20231,** on this date:

9/25/98

Date

Express Mail No.

EM509547849US

Attorney

Docket No.: 74047

**PRELIMINARY AMENDMENT**

Box PATENT APPLICATION  
Assistant Commissioner for Patents  
Washington, DC 20231

Sir:

Applicants through their undersigned attorneys, amend their above-identified divisional application as follows:

In the Specification:

Page 4, line 10, change "of" to --having--; delete "length" and insert --gaps between successive products--;

Same page, line 29, before "printed" insert --irregularly spaced--.

Page 5, line 1, before "printed" insert --irregularly spaced--.

Page 6, line 6, before "printed" insert --irregularly spaced--;

Same page 6, line 14, change "member" to --number--;

Same page, line 15, before "printed" insert --irregularly spaced--;

Same page, line 21, change "gaps" to --gap--;

Same page, line 35, delete "printing plate" and insert --knife-- therefor.

Page 8, line 20, after "of" insert --a modified embodiment of--.

Page 9, line 10, delete "comparing the manner of";

Same page, line 12, change "mace" to --made--.

Page 10, line 3, delete "As schematically illustrated in FIG. 10," and change "the" to --The--;

Same page, line 18, delete "the web" and insert --each press repeat--;

Same page, line 23, after "printer" add --, such as represented by printed products 26a-e of a first repeat length of web, and printed products 26'a and 26'b at the leading end of a second repeat length of the web--;

Same page, line 32, change "printer" to --cutter--.

Same page, line 10, delete "are rotatable in timed relation to the anvil cylinder 16 and";

Same page, line 12, after "cylinder" (second usage) insert --in a known manner--.

Page 12, line 4, change "pulley" to --roller--;

Same page, line 8, after "about" insert --a--; and change "pulleys" to --roller--;

Same page, line 9, after "and" insert --a roller--;

Same page, line 10, change "a" to --the--;

Same page, line 23, change "belts" to --belt--, insert a period (.) after "72", and delete "which preferably conform in number to the high speed";

Same page, line 24, delete "conveyor belts 54. Each of"; change "the" to --The--; and change "belts" (second usage) to --belt--;

Same page, line 25, change "pulley" to --roller--;

Same page, line 26, change "pulley" to --roller--;

Same page, line 30, after "idler" change "rollers" to --roller--, and after "drive" change "rollers 74" to --roller 76--;

Same page, line 31, change "belts" to --belt--;

Same page, line 32, change "motor" to --roller--;

Same page, line 33, change "or" to --controlled--.

Page 13, line 1, change "pulleys" to --roller--; and change "are" to --is--;

Same page, line 4, change "belts" to --belt--;

Same page, lines 11, 12 and 13, change "rollers" to --roller--;

Same page, line 25, change "rollers" (second usage) to --roller--;

Same page, line 27, change "surfaces" to --surface--;

Same page, line 28, change "reaches" to --reach--;

Same page, line 33, change "rollers" to --roller--.

Page 14, line 19, change "blade" to --blades--;

Same page, line 36, delete "printing plate cylinder with which" and insert --circular path traversed by the outer cutting edges of the knife blades carried on-- therefor; delete "and";

Same page, line 37, delete "delivery system 10 are used".

Page 15, line 34, change "a" to --as--.

Page 16, line 24, delete "bracket" and insert --pair of brackets 132a and 132b which are mounted on a plate-- therefor.

Page 21, In the Abstract, line 1, change "an" (second usage) to --and--.

In the Claims:

Cancel claim 1 after granting a filing date to the subject divisional application.

Cancel claims 2-6 without prejudice.

Add claims 7-22 as follows:

7. Apparatus for shingling successive sheet products cut from a substantially continuous web of sheet material, said apparatus comprising, in combination, a variable rotary cutter having a plurality of knife blades having cutting edges operative to cut the web generally transversely into irregularly spaced sheet products of substantially equal longitudinal lengths having leading and trailing edges, first conveyor means for receiving said sheet products in successive fashion from said rotary cutter and defining a first conveyor path along which said successive sheet products are conveyed in irregularly spaced relation at a first longitudinal speed, second conveyor means having an upstream end for receiving said sheet products in successive fashion from said first conveyor means and defining a second conveyor path along which said sheet products are conveyed at a slower longitudinal speed than said first longitudinal speed, knockdown means including at least one rotary knockdown wheel spaced above and generally adjacent said upstream end of said second conveyor means, said knockdown wheel having a plurality of knockdown members adjustable about an outer periphery of said wheel, said knockdown members being equal in number to the number of knife blades on said rotary cutter that establish said trailing edges of said irregularly spaced sheet products and being positioned about the outer periphery of said wheel so that outer surfaces of said knockdown members are operative to engage and depress successive sheet products generally adjacent their trailing edges as said irregularly spaced sheet products pass from said first to said second conveyor means whereby to enable shingling of successive sheet products, and means for rotating said knockdown wheel so that said outer surfaces

of said knockdown members have a tangential velocity substantially equal to the tangential velocity of said knife cutting edges during operation of said apparatus.

8. Apparatus as defined in claim 7 wherein said knockdown wheel has a center axis of rotation, said knockdown members being disposed in generally radial relation to said center axis.

9. Apparatus as defined in claim 8 wherein said knockdown members lie substantially in a common plane transverse to said axis of rotation of said knockdown wheel.

10. Apparatus as defined in claim 8 wherein said knockdown members include brush bristles defining said outer surfaces thereof.

11. Apparatus as defined in claim 7 including brake means for engaging an undersurface of the trailing edge of each successive sheet product as it is engaged by a knockdown member so as to assist in decelerating each said sheet product as it enters said second conveyor means.

12. Apparatus as defined in claim 7 including means for varying the rotational phase relation between said rotary cutter and said knockdown wheel so as to vary the point of engagement of said knockdown members with said sheet products relative to the trailing edges of said sheet products.

13. Apparatus as defined in claim 12 wherein said means for varying said rotational phase relation comprises a harmonic drive operatively associated with said rotary cutter and said knockdown wheel.

14. Apparatus as defined in claim 12 wherein said means for varying said rotational phase relation comprises a differential gear drive operatively associated with said rotary cutter and said knockdown wheel.

15. Apparatus as defined in claim 7 including headstop means operatively associated with said second conveyor means so as to engage a leading edge of each successive printed product and effect deceleration thereof as said product passes to said second conveyor means, said headstop means being positioned to be engaged by the leading edge of a printed product when the trailing edge of said product is adjacent the upstream end of said second conveyor means.

16. A system for producing printed sheet products, comprising, in combination, a rotary print cylinder operative to produce a plurality of printed products on a continuous length longitudinally moving web during each repeat of the print cylinder, a variable rotary knife cylinder downstream from said print cylinder and operative to sever the web generally transversely so as to create individual irregularly spaced printed products having leading and trailing edges, a first conveyor operative to receive said individual irregularly spaced printed products from said knife cylinder and convey said printed products at a first speed, a second conveyor operative to receive said irregularly spaced printed products from said first conveyor and convey said products at a slower speed than said first speed, headstop means operatively associated with said second conveyor for cooperation with each successive printed product to momentarily decelerate movement of each said successive printed product received from said first conveyor when the trailing edge of each said printed product is adjacent an upstream end of said second conveyor, and at least one knockdown wheel supported adjacent said upstream end of said second conveyor, said knockdown wheel having a plurality of kicker members disposed about its periphery equal to, or a whole integer multiple of, the number of printed products created by said print cylinder during each repeat revolution thereof, said knockdown wheel being positioned and rotated so that each kicker member engages the trailing edge of a printed product when the leading edge of said printed product engages said headstop means to facilitate shingling of successive printed products passing

from said first to said second conveyor.

17. In a delivery system for receiving a printed web from a rotary print cylinder operative to print a plurality of equal length irregularly spaced printed products on each repeat length of the web, said system further including a variable rotary knife cylinder having a plurality of knife blades thereon positioned to sever each said repeat length of web so as to create irregularly spaced individual equal length printed products having leading and trailing edges, a first conveyor for conveying said individual printed products from said knife cylinder along a predetermined path at a first speed, and a second conveyor having an upstream end adapted to receive said printed products from said first conveyor and convey said products at a speed less than said first speed; the combination therewith comprising at least one knockdown wheel having a generally circular periphery and a center axis of rotation, said knockdown wheel having a plurality of knockdown elements supported about said periphery equal in number to the number of knife blades on said knife cylinder that establish said trailing edges of said printed products severed from said web, said knockdown wheel enabling adjustable positioning of said knockdown elements about said periphery in angular circumferential positions corresponding to the angular circumferential positions of said knife blades that establish said trailing edges, and means for supporting said knockdown wheel adjacent said upstream end of said second conveyor for rotation about said center axis in rotational phase relation to rotation of said knife cylinder such that said knockdown elements depress each successive printed product generally adjacent its trailing edge as said irregularly spaced printed products pass from said first to said second conveyor.

18. The system as defined in claim 17 including at least one headstop roller cooperative with said second conveyor to define a nip operative to receive the leading edge of each successive printed product passing from said first to said second conveyor, said nip being operative to reduce



the speed of each successive printed product entering said nip when the trailing edge of said printed product underlies said knockdown wheel preparatory to being engaged by one of said knockdown elements.

19. Apparatus for making a plurality of printed products from a continuous web comprising, in combination, a rotary print cylinder, means for effecting cooperation between the web and said print cylinder so as to create a plurality of generally equal length printed products on a repeat length of the web during each rotational repeat of said print cylinder and wherein the printed products are irregularly spaced between a leading edge and a trailing edge of each repeat length of web, a rotary cutter having knife blades thereon, means for effecting cooperation between said repeat length of web and said variable rotary cutter so that said knife blades sever the web and create discrete irregularly spaced equal length printed products having leading and trailing edges, first conveyor means for conveying the severed irregularly spaced printed products from said rotary cutter along a first conveyor path at a first speed, second conveyor means for conveying the severed irregularly spaced printed products from said first conveyor path along a second conveyor path at a second speed less than said first speed, said second conveyor path having an upstream end positioned to receive said severed irregularly spaced printed products from said first conveyor path, and at least one knockdown wheel having an axis of rotation and a generally circular periphery and having a plurality of knockdown elements adjustable about said periphery, said knockdown elements being equal in number and positioned at substantially corresponding angular positions about said axis of rotation as are said knife blades on said rotary cutter that create said trailing edges of said printed products severed from said repeat length of said web, said knockdown wheel being positioned generally adjacent said upstream end of said second conveyor path so that effecting rotation of said wheel about said axis of rotation in predetermined phase relation to said rotary

cutter causes said knockdown elements to each engage a discrete printed product received from said first conveyor path generally adjacent its trailing edge to enable the leading edge of each successive printed product received from said first conveyor path to pass over the trailing edge of the preceding printed product in shingled fashion.

20. In apparatus for conveying irregularly spaced printed products from a first conveyor to a second conveyor traveling at a slower speed than the first conveyor, and wherein said printed products have leading and trailing edges and are formed by a rotary cutter from predetermined equal lengths of a continuous web so that each predetermined length of web has an equal number of irregularly spaced equal length printed products formed therefrom; the improvement comprising a knockdown wheel supported adjacent an upstream end of the second conveyor and operative to engage the trailing edge of each successive printed product as it is conveyed from said first to said second conveyor, said knockdown wheel having an axis of rotation and a substantially circular periphery, and a plurality of knockdown elements mounted on said periphery so as to enable selective angular adjustment of said knockdown elements about said axis of rotation, said knockdown elements being equal in number to the number of said printed products formed from each said predetermined length of web and being positioned so that upon rotating said knockdown wheel in predetermined phase relation to said rotary cutter, said knockdown elements engage said trailing edges of said irregularly spaced products conveyed from said first to said second conveyor.

21. A method for making a plurality of printed products from a continuous web, comprising the steps of:

effecting cooperation between the web and a rotatable print cylinder so as to create a plurality of generally equal length printed products on a repeat length of the web during each rotational repeat of said print cylinder and wherein the printed products are irregularly spaced

between a leading edge and a trailing edge of each repeat length of web,

effecting cooperation between said repeat length of web and a variable rotary cutter having knife blades operative to sever the web so as to create discrete generally equal length irregularly spaced printed products having leading and trailing edges,

conveying the severed irregularly spaced printed products from said rotary cutter along a first conveyor path at a first speed,

conveying the severed irregularly spaced printed products from said first conveyor path along a second conveyor path at a second speed less than said first speed, said second conveyor path having an upstream end positioned to receive said severed printed products from said first conveyor path,

providing at least one knockdown wheel having a center axis and a generally circular periphery and having a plurality of knockdown elements adjustable about said periphery to correspond in number and angular relation to said knife blades on said rotary cutter that create said trailing edges of said irregularly spaced printed products severed from a repeat length of said web, and

positioning said knockdown wheel generally adjacent said upstream end of said second conveyor path and effecting rotation of said wheel about said center axis so that each of said knockdown elements engages a discrete printed product received from said first conveyor path generally adjacent its trailing edge so as to enable the leading edge of each successive printed product received from said first conveyor path to pass over the trailing edge of the preceding printed product in shingled fashion.

22. A method for shingling printed products made from a continuous web having printed products formed thereon by a rotary print cylinder so that, for a repeat length of the web

having a leading end and a trailing end, a plurality of equal length printed products are irregularly spaced along said repeat length to create a waste strip at either said leading or trailing end thereof, said method comprising the steps of:

effecting cooperation between said repeat length of web and a rotary cutter having knife blades operative to sever the web and create discrete equal length, irregularly spaced printed products having leading and trailing edges,

conveying said discrete irregularly spaced products from said rotary cutter along a first conveyor path at a first speed to a second conveyor path operative to convey said products at a second speed less than said first speed, said second conveyor path having an upstream end positioned to receive said products from said first conveyor path,

providing at least one rotatable knockdown wheel having a plurality of knockdown elements adjustable about a rotational axis of said wheel so that said knockdown elements correspond in number and angular relation about said rotational axis to said knife blades on said rotary cutter that create said trailing edges of said printed products, and

positioning said knockdown wheel generally adjacent said upstream end of said second conveyor path and effecting rotation of said wheel so that each of said knockdown elements momentarily engages a discrete printed product adjacent its trailing edge as said product is received from said first conveyor path to enable the leading edge of the next successive printed product received from said first conveyor path to pass over said momentarily engaged trailing edge in shingled fashion.

This Preliminary Amendment accompanies a Petition to Make Special Under 37 C.F.R. § 1.102(d) that encloses prior patents known to applicants' and that may be material to examination of above claims 7-22. The prior patents comprise applicants' Information Disclosure Statement Under

37 C.F.R. 1.56, 1.98 and 1.99, and a Form PTO-1449 is enclosed with the Petition to make Special.

Applicants' claims 7-22 as presented herein are believed to be allowable over the prior art known to applicants, and their allowance is earnestly solicited.

Respectfully submitted,

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By 

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1 DECELERATING MECHANISM FOR PRINTED PRODUCTS

2 Background of the Invention

3 The present invention relates generally to apparatus  
4 for controlling shingling of printed products conveyed in  
5 sequential order from a rotary printing press and variable rotary  
6 cutter to a stacking or handling station, and more particularly  
7 to novel mechanism for effecting improved deceleration and  
8 shingling as each printed product passes from a first high speed  
9 conveyor to a slower speed second conveyor.

10 The speed and efficiency of a rotary printing press is  
11 dependent in part on the delivery system following passage of a  
12 printed web from the printing press, through an in-line finishing  
13 system, if utilized, and then through a rotary cutter operative  
14 to cut or sever the printed web transversely into finished or  
15 unfinished printed products which are then conveyed to a stacking  
16 or other handling station. A common press repeat length of  
17 conventional rotary printers is 22 $\frac{1}{4}$  inches which is essentially  
18 the circumference of the printing plate cylinder of the press.  
19 Other press repeat lengths are also employed. When the press  
20 repeat length is a single circumference of the printing plate  
21 cylinder, it is a conventional practice to make the knife and  
22 anvil cylinders of the rotary cutter twice the diameter of the  
23 printing plate cylinder for structural strength purposes. A pair  
24 of knife blades carried 180° apart on the periphery of the knife  
25 cylinder of the rotary cutter will sever the printed web at the  
26 end of each press repeat, assuming there is no blanket or blank  
27 gap on the forward end of the press repeat length of web and that  
28 the rotational speed of the rotary cutter is in timed relation  
29 with the speed of the rotary printing press.

1           It is a conventional practice to accelerate movement  
2 of the severed printed products as they leave the rotary cutter  
3 so as to create a space between the trailing edge of each product  
4 and the leading edge of the next successive product leaving the  
5 rotary cutter. Conventional practice further entails conveying  
6 the severed products at the accelerated rate along a first  
7 conveyor path, generally defined by juxtaposed parallel runs of  
8 conveyor belts moving at the accelerated speed, such as a speed  
9 10% greater than the web speed through the print or blanket  
10 cylinders, to a second conveyor path defined by at least one  
11 conveyor belt moving at a slower speed. To facilitate shingling  
12 of the printed products as they enter and are conveyed by the  
13 second conveyor toward a stacking or other handling station, it  
14 is desirable that the trailing edge of each successive product  
15 be depressed momentarily after the product enters the second  
16 conveyor and the trailing edge leaves the first conveyor so that  
17 the leading edge of the next succeeding printed product passes  
18 over the depressed trailing edge to effect shingling.

19           One known technique for depressing the trailing edge  
20 of each successive printed product leaving the first accelerated-  
21 movement conveyor path so as to facilitate shingling is to  
22 provide a rotary wheel or arm that is rotated in a generally  
23 vertical plane at the same rotational speed as the rotary press  
24 and on which is mounted a depressor member operative to engage  
25 and depress the trailing edge of each successive printed product  
26 as it leaves the first conveyor path and enters the slower speed  
27 second conveyor path. This technique assists in effecting  
28 shingling as long as the repeat length on the rotary press is a  
29 full repeat length or is equal to one-half of a full repeat  
30 length. In the latter case, a pair of depressors may be mounted  
31 on the carrier spaced 180° apart. Alternatively, the rotational  
32 speed of the single depressor carrier may be doubled. This,  
33 however, creates a problem in that the depressor member is now  
34 moving at a tangential velocity greater than the velocity of the  
35 printed product received from the accelerated speed conveyor.  
36 This tends to increase the surface speed of the product in

1 conflict with the action of the slower speed second conveyor path  
2 which is trying to slow down the speed of the product.

3 Another problem with prior techniques which utilize a  
4 rotary arm carrying one or two diametrically opposed depressor  
5 members for depressing the trailing edges of successive products  
6 leaving the accelerated-speed conveyor path so as to effect  
7 product shingling is that they fail to compensate for situations  
8 where the rotary press and rotary cutter are designed to produce  
9 trimmed and untrimmed printed products having variable  
10 longitudinal lengths measuring a fraction of the press repeat  
11 length other than one-half, such as one-third, one-fourth, one-  
12 fifth or two-thirds of the printing press repeat length. The  
13 latter product lengths are commonly described as resulting from  
14 "three-around", "four-around", "five-around", etc., press  
15 repeats. Further, the prior techniques for effecting shingling  
16 of printed products received from a rotary cutter fail to  
17 compensate for the transverse scrap or non-image waste strip  
18 generally produced between the press repeat length or individual  
19 finished product. As a result, where a plurality of printed  
20 products are cut from each press repeat, the point of contact  
21 between the depressor member and each successive product takes  
22 place progressively closer to the trailing edge of the product.  
23 This creates cumulative error and significantly inhibits desired  
24 shingling between successive printed products as they pass from  
25 the accelerated speed conveyor path to the slower conveyor path  
26 on the way to a stacker or other handling station.

27 In addition to depressing the trailing edge of each  
28 successive printed product passing from the high speed conveyor  
29 to the slower speed conveyor to effect shingling of the products  
30 disposed on the slower speed conveyor, it is highly desirable  
31 that each product be decelerated as it enters the slower conveyor  
32 so as to prevent buckling and wrinkling of the individual  
33 products. Known systems for delivering printed products in  
34 sequential fashion from a printing press effect deceleration of  
35 the products after they have entered a reduced speed belt  
36 conveyor from a higher speed belt conveyor by causing the leading  
37 edge of each product to enter a nip defined between the reduced



1 speed conveyor belts and at least one idler roller.  
2 Simultaneously with the leading edge entering this nip, the  
3 trailing edge of the product is pressed against the reduced speed  
4 conveyor belts by means of a knock-down arm at the upstream end  
5 of the second conveyor. A significant problem with this  
6 arrangement is that there is no provision for adjustment of the  
7 braking action applied to the products, thus failing to enable  
8 adjustment of the braking pressure applied to each printed  
9 product. Moreover, this arrangement is limited to use with sheet  
10 or printed products of equal length.

11 Thus, a need exists for an arrangement or mechanism  
12 which facilitates shingling of printed products being conveyed  
13 from a first relatively high speed conveyor to a reduced speed  
14 conveyor disposed downstream from a variable rotary cutter  
15 operative to cut variable length printed products from a web  
16 received from a rotary printer, each printed product being  
17 precisely engaged at its trailing edge in timed relation to  
18 entering the reduced speed conveyor so as to depress the trailing  
19 edge and effect engagement with a stationary brake pad to both  
20 decelerate the product and facilitate shingling of printed  
21 products carried by the reduced speed conveyor.

#### 22 Summary of the Invention

23 One of the primary objects of the present invention is  
24 to provide a novel mechanism for effecting improved shingling of  
25 printed products conveyed from a variable rotary cutter disposed  
26 downstream from a rotary printing press.

27 A more particular object of the invention is to provide  
28 a novel mechanism for depressing the trailing edges of successive  
29 printed products as they pass from an accelerated-speed conveyor  
30 to a slower speed conveyor so as to facilitate shingling of the  
31 sheet products, the mechanism being operative to engage the  
32 trailing edge of each successive printed product at substantially  
33 the same location notwithstanding that an irregular gap occurs  
34 periodically between successive products.

35 A further object of the present invention is to provide  
36 a novel mechanism for momentarily depressing the trailing edges

1 of successive printed products as they pass from a relatively  
2 high speed conveyor to a slower speed conveyor downstream from  
3 a rotary cutter so as to facilitate shingling of the products,  
4 the mechanism including depressors carried on at least one rotary  
5 wheel for cooperation with a brake pad to both depress the  
6 trailing edge of each printed product and effect deceleration  
7 thereof.

8 Still another object of the present invention is to  
9 provide a novel arrangement for decelerating printed products as  
10 they are conveyed from a variable rotary cutter through a  
11 relatively high speed conveyor to a slower speed conveyor so that  
12 the printed products are shingled as they are conveyed by the  
13 slower speed conveyor, the arrangement including a plurality of  
14 depressor or kicker members carried on a rotating carrier or  
15 wheel and operative to accurately engage and depress the trailing  
16 edge of each successive printed product as it passes from the  
17 high speed conveyor to the slower speed conveyor, and a brake pad  
18 cooperative with the depressor members to decelerate each product  
19 simultaneously with depressing its trailing edge, the brake pad  
20 being adjustable during movement of the products so as to  
21 selectively vary the frictional decelerating forces applied to  
22 the products and thereby vary the extent of deceleration.

23 A feature of the present invention lies in the  
24 provision of a rotatable depressor or kicker wheel having a  
25 plurality of depressor or kicker members carried about its  
26 periphery, the depressor members being selectively adjustable  
27 about the depressor wheel to enable angular phasing with the  
28 positions of the knife blades carried on the variable rotary  
29 cutter and being coordinated with the repeat pattern of the  
30 rotary printing press so as to accurately engage and depress the  
31 trailing edge of each successive printed product into cooperation  
32 with a brake pad to selectively decelerate the products and  
33 facilitate shingling of the printed products irrespective of the  
34 removal of dissimilar size transverse scrap or non-image waste  
35 strip between individual products.

36 Another feature of the invention lies in the  
37 utilization of brush bristles as the depressor or kicker members

1 carried about the depressor wheel, the brush bristles being  
2 operative to momentarily depress the trailing edge of each  
3 successive printed product against the friction pad without  
4 adversely affecting the upper printed surfaces of the products.

5 In carrying out the present invention, an arrangement  
6 is provided for decelerating successive printed products as they  
7 are conveyed from a variable rotary cutter by a high-speed belt  
8 conveyor to a slower speed belt conveyor, the products having  
9 been cut to equal lengths by the rotary cutter after receipt from  
10 a rotary web printing press. The variable rotary cutter carries  
11 a plurality of knife blades which are adjustable about the  
12 periphery of the cutter cylinder so as to cut the printed web to  
13 remove any blanket gap from the lead end of the press repeat and  
14 then butt cut the web transversely to create a member of equal  
15 length printed products as established by the print cylinder  
16 during each revolution or press repeat. Alternatively, the knife  
17 blades on the cutter cylinder may be positioned to trim any  
18 blanket gap created in a given press repeat length of printed  
19 web, and to cut out any bleed trim between the resulting equal  
20 length printed products within the given press repeat length of  
21 web. As a result of the blanket gaps cut from each press repeat  
22 length of web, the equal length printed products conveyed by the  
23 high speed belt conveyor to the lower speed belt conveyor will  
24 have unequal spacing between the last product of each press  
25 repeat and the first product of the next press repeat.

26 The decelerating arrangement of the present invention  
27 compensates for any unequal spacing between successive printed  
28 products conveyed from the high speed conveyor by providing at  
29 least one depressor or kicker wheel rotatable in a substantially  
30 vertical plane at the entry end of the slower speed conveyor.  
31 The depressor or kicker wheel carries a plurality of depressor  
32 or kicker members in the form of generally radial bristle brushes  
33 which have outer ends lying on a circle concentric with the axis  
34 of rotation of the wheel and having a diameter substantially  
35 equal to the outer diameter of the printing plate cylinder. The  
36 depressor members are disposed about the kicker wheel in angular  
37 circumferential positions corresponding to the angular

1 circumferential positions of the cutting knives on the rotary  
2 cutter which create the trailing edge of each successive printed  
3 product formed by the rotary cutter.

4 When a printed product passes from the high-speed belt  
5 conveyor immediately downstream of the rotary cutter into the  
6 slower speed belt conveyor, the leading edge of the printed  
7 product enters a nip defined between one or more transversely  
8 aligned headstop idler rollers and the slower moving belt of the  
9 second conveyor. This nip operates to immediately reduce the  
10 speed of the entering printed product and is positioned  
11 downstream from the depressor wheel so that the trailing edge of  
12 the product now underlies and is engaged and depressed by the  
13 next depressor brush on the rotating depressor wheel. Because  
14 the speed of each print product leaving the high speed belt  
15 conveyor is substantially the same, the only variable affecting  
16 the timing of entry of the printed products into the slower belt  
17 conveyor headstop nip is the spacing between successive products  
18 passing downstream from the high speed conveyor, as caused by  
19 removal of the blanket gap from each press repeat length of  
20 printed web. By spacing the depressor or kicker brushes about  
21 the depressor or kicker wheel in corresponding angular relation  
22 to the knife blades on the rotary cutter which established the  
23 trailing edges of successive printed products, the specific  
24 depressor or kicker brush on the depressor wheel which  
25 corresponds to the last-to-cut knife blade on the rotary cutter  
26 will momentarily engage and depress the trailing edge of printed  
27 product which has just entered the slower belt conveyor so as to  
28 enable the leading edge of the next succeeding printed product  
29 to pass over the depressed trailing edge and effect shingling  
30 between successive products.

31 In order to further decelerate forward movement of each  
32 printed product entering the slower belt conveyor, a stationary  
33 brake pad is supported slightly below the path traversed by the  
34 products passing from the high speed conveyor to the slower speed  
35 conveyor and also generally vertically below the rotational axis  
36 of the depressor wheel. The brake pad is vertically adjustable  
37 so as to cooperate with the depressor or kicker brushes to

1 sandwich the momentarily depressed trailing ends of the printed  
2 products between the brushes and the brake pad with sufficient  
3 frictional pressure to decelerate the corresponding printed  
4 product close to the surface speed of the slower belt conveyor.  
5 In this manner, successive printed products are caused to  
6 shingle and decelerate irrespective of unequal spacing between  
7 the conveyed printed products due to removal of dissimilar size  
8 transverse scrap or blanket gaps or non-image waste strips  
9 between individual printed products.

10 Further objects, features and advantages of the  
11 invention, together with the organization and manner of operation  
12 thereof, will become apparent from the following detailed  
13 description of the invention taken in conjunction with the  
14 accompanying drawings wherein like reference numerals designate  
15 like elements throughout the several views.

#### 16 Brief Description of the Drawings

17 FIG. 1 is a perspective view of a variable rotary  
18 cutter and associated printed product delivery arrangement in  
19 accordance with the present invention;

20 FIG. 2 is a side elevational view of the product  
21 delivery arrangement of FIG. 1, the near side frame wall being  
22 removed and portions broken away for clarity and the rotary  
23 cutter being schematically illustrated in phantom;

24 FIG. 3 is a side view, on an enlarged scale, of a  
25 depressor or kicker wheel as employed in the product delivery  
26 arrangement of FIG. 2;

27 FIG. 4 is a side edge view of the kicker wheel  
28 illustrated in FIG. 3, taken along lines 4-4 of FIG. 3;

29 FIG. 5 is a fragmentary sectional view illustrating the  
30 manner of mounting the depressor or kicker brushes on the kicker  
31 wheel of FIG. 3;

32 FIG. 6 is a laterally foreshortened generally vertical  
33 sectional view illustrating the manner of supporting the  
34 adjustable brake pad illustrated in FIG. 2;

1           FIG. 7 is a fragmentary detail view taken substantially  
2 along line 7-7 of FIG. 6 illustrating the brake pad and  
3 associated support linkage;

4           FIG. 8 is a fragmentary side elevational view taken  
5 substantially along line 8-8 of FIG. 6 illustrating the  
6 adjustment mechanism for the brake pad;

7           FIG. 9 is a schematic plan view of a length of printed  
8 web showing in dash lines the transverse cuts made by the rotary  
9 cutter between individual products after leaving the printing  
10 press, and comparing the manner of also showing the points of  
11 contact with the depressor wheel of the subject invention as  
12 compared to points of contact made with knock-down arms as used  
13 in prior printed product delivery systems;

14           FIG. 10 is a schematic diagram illustrating the  
15 relative sequence positions of printing cylinders, rotary cutter,  
16 and rotary kicker wheel/brake pad arrangement operative to print,  
17 cut and shingle printed products in accordance with the present  
18 invention.

#### 19                           Detailed Description

20           Referring now to the drawings, and in particular to  
21 FIG. 1, a printed product delivery system or arrangement for  
22 decelerating and shingling printed products in accordance with  
23 the present invention is indicated generally at 10. The delivery  
24 system or arrangement 10 serves to decelerate and effect  
25 shingling of printed products received from a variable rotary  
26 cutter, indicated generally at 12, as the products are conveyed  
27 from a high speed belt conveyor to a slower speed belt conveyor,  
28 as will be described. The variable rotary cutter 12 is  
29 preferably of known computer controlled design, such as  
30 commercially available from Scheffer, Inc., Merrillville, IN, and  
31 includes a rotary knife cylinder 14 and a parallel anvil cylinder  
32 16 which are operative to rotate in timed relation in a known  
33 manner. The knife cylinder 14 is adapted to carry a plurality  
34 of knife or cutter blade assemblies, one of which is indicated  
35 at 18, about the periphery or circumference of the knife cylinder  
36 so that the knife blade assemblies cooperate with the anvil

1 cylinder to cut or sever a continuous web of paper received from  
2 a rotary printing press, as schematically illustrated at 20 in  
3 FIG. 10. As schematically illustrated in FIG. 10, the printing  
4 press 20 typically includes upper and lower printing plate  
5 cylinders 22a and 22b which determine the press repeat length,  
6 and a pair of upper and lower blanket cylinders 24a and 24b which  
7 print on both sides of a continuous web of paper or the like,  
8 indicated at 26 in FIG. 9, passed through the nip defined between  
9 the blanket cylinders.

10 The knife cylinder 14 and anvil cylinder 16 of the  
11 variable rotary cutter 12 define a nip therebetween which  
12 receives the printed web from the rotary printer 20 so as to  
13 sever a repeat length of the web into a plurality of  
14 substantially equal length printed products, indicated at 26a-e  
15 in FIG. 9, separated by transverse butt cuts indicated by dash  
16 lines 28. In printing a continuous web with a rotary press, a  
17 transverse scrap or blanket gap will frequently be formed at the  
18 forward or rearward end of the web, such as indicated at 30 at  
19 the forward end of each press repeat length of web 26. The  
20 rotary cutter is operative to remove the blanket gaps as by  
21 effecting a transverse cut 32 which defines the leading edge of  
22 the first printed product in a press repeat length of web coming  
23 from the printer.

24 As is known, a length of printed web coming from a  
25 rotary printer may also have non-image waste strips formed  
26 between the individual equal length printed products, such as  
27 26a-e. In this situation, the rotary cutter blades are  
28 positioned so as to remove the transverse non-image waste strips  
29 between the individual printed products as they are severed and  
30 conveyed downstream from the rotary cutter. If desired, the  
31 printed web may be passed through an in-line finishing system  
32 (not shown) prior to passing through the rotary printer 12. The  
33 knife cylinder 14 is illustrated schematically in FIG. 10 as  
34 having a diameter twice the diameter of the printing plate  
35 cylinders 22a and 22b so that each 180° circumference of the  
36 knife cylinder has a similar arrangement of knife cutters to  
37 transversely cut or sever a press repeat length of the printed

1 web. Alternatively, the printing plate cylinders 22a and 22b may  
2 be made of a diameter equal to the diameter of the knife cylinder  
3 14 in which event the cutter knives carried about the knife  
4 cylinder would be circumferentially spaced to remove the blanket  
5 gaps 30 and form substantially equal length printed products  
6 along each press repeat length of web by transverse butt cuts 28  
7 or cuts sufficient to remove non-image waste strips between  
8 successive printed products. As illustrated in FIG. 1, the  
9 rotary cutter 12 includes a pair of pin wheels 36a and 36b which  
10 are rotatable in timed relation to the anvil cylinder 16 and are  
11 operative to remove chips or waste strips removed from the cutter  
12 cylinder 14 by radial pins disposed about the anvil cylinder.

13 Referring again to FIG. 1, the printed product delivery  
14 system or arrangement 10 includes a pair of side frames or plates  
15 40a and 40b which are secured in upstanding laterally spaced  
16 relation by cross frame members (not shown). The side frame  
17 plates 40a and 40b have rollers 42 mounted at their lower edges  
18 to facilitate movement in a pair of tracks 44a and 44b disposed  
19 transverse to a vertical plane containing the rotational axes of  
20 the knife and anvil cylinders 14 and 16 and enabling movement of  
21 the product delivery system into close proximity to the rotary  
22 cutter or to a position spaced from the rotary cutter to  
23 facilitate service or adjustment of the various components of the  
24 rotary cutter as well providing access to a forward end of the  
25 product delivery system. A control panel 46 is mounted on the  
26 side frame 40a to facilitate operator control of various  
27 functions of the product delivery system.

28 Referring to FIG. 2, the product delivery system 10 has  
29 a first relatively high speed belt conveyor, indicated generally  
30 at 50, mounted between the side frame plates 40a and 40b such  
31 that the high speed conveyor defines an entry nip 52 which is  
32 configured and at a height adapted to receive printed products,  
33 such as 26a-e, etc., from the rotary cutter 12. The high speed  
34 belt conveyor 50 includes a plurality of laterally spaced lower  
35 endless belts 54 each of which is reeved about and supported by  
36 a plurality of idler rollers including a pair of horizontally  
37 aligned rollers 56a and 56b which establish a reach 54a extending



1 horizontally rearwardly or downstream from the receiving nip 52.  
2 Each conveyor belt 54 is also reeved about an idler pulley 58  
3 which is adjustable to selectively adjust the tension in the  
4 conveyor belt with respect to a drive pulley 60 controlled by a  
5 suitable drive motor.

6 The high speed belt conveyor 50 also includes a  
7 plurality of upper endless belts 64 equal in number to the lower  
8 belts 54 and which are reeved about suitable idler pulleys 66a  
9 and 66b to define a horizontal reach 64a which overlies the reach  
10 54a of a lower conveyor belt so as to cooperate therewith to  
11 convey printed products from the rotary cutter through the  
12 horizontal path defined between reaches 54a and 64a at an  
13 accelerated speed. For example, the surface speed imparted to  
14 each printed product by the rotary cutter 12 may approach  
15 approximately 1,000 fpm which is then accelerated by the high  
16 speed conveyor 50 to a surface speed of approximately 1,100 fpm  
17 to 1,200 fpm or higher.

18 The product delivery system 10 also includes a slower  
19 speed belt conveyor, indicated generally at 70, which is  
20 supported between the upstanding side frames 40a and 40b and is  
21 operative to receive printed products from the high speed  
22 conveyor 50. The belt conveyor 70 includes one or more conveyor  
23 belts 72 which preferably conform in number to the high speed  
24 conveyor belts 54. Each of the slower speed conveyor belts 72  
25 is reeved about a forward idler pulley 74 and a rearward drive  
26 pulley 76 so as to define a horizontal reach 72a parallel to and  
27 spaced below the rearward end of the horizontal reach 64a of the  
28 upper conveyor belts 64 a distance greater than the thickness of  
29 the printed products being conveyed through the product delivery  
30 system 10. The idler rollers 74, drive rollers 74 and tension  
31 adjustment rollers 78 for the belts 72 are preferably mounted on  
32 a carriage 80 which is pivotal about the axis of the drive motor  
33 76 by means of a control linkage 82 actuated by a solenoid or  
34 double acting cylinder 84 which enable the horizontal conveyor  
35 reach 72a to be moved downwardly to clear any paper jams or the  
36 like.

1           The drive pulleys 76 are driven by a drive motor or  
2 other suitable drive means so as to establish a surface speed of  
3 approximately 300 fpm along the horizontal reach 72a of the  
4 conveyor belts 72. With the high speed belt conveyor 50 and  
5 slower speed belt conveyor 70 being supported as aforescribed,  
6 each printed product received by the high speed conveyor from the  
7 rotary cutter 12 will have its surface speed accelerated as the  
8 printed product is conveyed by the high speed conveyor belts 54  
9 and 64. As each successive printed product exits from the exit  
10 end of the lower high speed conveyor belts 54, as established by  
11 the idler rollers 56b, it will traverse the gap between the  
12 downstream idler rollers 56b of the high speed belt conveyor and  
13 the upstream idler rollers 74 of the slower speed belt conveyor  
14 and pass onto the horizontal reach of the slower speed conveyor  
15 belts 72.

16           In order to reduce the surface speed of each printed  
17 product entering the slower speed belt conveyor from the higher  
18 speed belt conveyor, at least one, and preferably two or more  
19 axially aligned headstop idler rollers 88 are supported on a  
20 transverse support shaft or axle 90 which in turn is supported  
21 on the outer ends of one or more pivot arms 92 having their upper  
22 ends pivotally mounted on a transverse support shaft 94. The  
23 pivot arms 92 and headstop rollers 88 are supported on a  
24 horizontal track 96 in a manner to enable horizontal adjustment  
25 of the headstop rollers 88 relative to the upstream idler rollers  
26 74 of the slower speed conveyor 70. The headstop rollers 88 are  
27 urged by gravity against the upper surfaces of the horizontal  
28 belt reaches 72a of the slower speed belt conveyor 70 and define  
29 a nip therewith so that the leading edge of each successive  
30 printed product will enter the nip and undergo immediate  
31 deceleration.

32           The headstop rollers 88 are spaced from the upstream  
33 idler rollers 74 of the slower belt conveyor 70 a distance  
34 slightly less than the longitudinal length of the printed  
35 products being cut from the printed web so that as the leading  
36 edge of each successive printed product enters the headstop nip,

1 its trailing edge will overlies the gap between the high speed and  
2 low speed belt conveyors 50 and 70.

3 In accordance with one feature of the present  
4 invention, at least one and preferably a pair of axially aligned  
5 depressor or kicker wheels, one of which is indicated generally  
6 at 100 in FIG. 2, are mounted between the upstanding frame plates  
7 40a and 40b for rotation about a transverse rotational axis which  
8 overlies the gap between the high speed and low speed conveyors.  
9 Referring to FIGS. 3-5, taken with FIG. 2, each of the depressor  
10 or kicker wheels 100 includes a generally circular wheel plate  
11 102 having a circular center opening 102a and to which is  
12 coaxially connected a mounting hub 104 to facilitate mounting of  
13 the depressor or kicker wheels on a transverse rotatably driven  
14 axle 107 journaled between the upstanding frame plates 40a and  
15 40b. The axle 107 is connected to a suitable drive motor (not  
16 shown) to effect rotation of the kicker wheels 100 in a  
17 counterclockwise direction, as viewed in FIG. 2. Each kicker  
18 wheel carries a plurality of depressor or kicker members 106  
19 which correspond in number to the number of cutter blade spaced  
20 about the cutter cylinder 14 that establish the trailing edges  
21 of the printed products formed from the printed web. In the  
22 illustrated embodiment, each of the depressor or kicker members  
23 106 has a base 106a which may be made of a suitable plastic  
24 material and which has a generally arcuate side profile so as to  
25 seat on an annular rim surface 102b formed on the wheel 102  
26 concentric to its center axis. The kicker members 106 may be  
27 secured in selected circumferential position about the axis of  
28 the kicker wheel by an annular retaining ring 108 which is  
29 releasably attached to the wheel plate by fasteners 110 as  
30 illustrated in FIG. 5. The base 106a of each kicker member 106  
31 has a plurality of brush bristles 106b secured therein such that  
32 the bristles extend generally radially outwardly from the  
33 rotational axis of the kicker wheel and have outer ends lying in  
34 a circle concentric to the rotational axis of the kicker wheel  
35 and having a diameter substantially equal to the diameter of the  
36 printing plate cylinder with which the rotary cutter 14 and  
37 delivery system 10 are used.

1           The kicker wheels 100 are positioned to overlies the gap  
2 between the high speed and low speed belt conveyors 50 and 70 so  
3 that as the kicker wheels rotate, the outer end of each depressor  
4 or kicker member 106 will momentarily depress the trailing edge  
5 of a printed product whose leading edge has entered the headstop  
6 nip, thereby enabling the leading edge of the next successive  
7 printed product to pass over the depressed trailing end and  
8 shingle therewith.

9           As aforescribed, the depressor or kicker members 106  
10 are spaced circumferentially about the kicker wheel plate 102 so  
11 as to angularly correspond to each of the cutter blades on the  
12 cutter cylinder 14 which create a trailing edge on a printed  
13 product formed from the printed web. The rotational speed and  
14 angular position of each of the depressor or kicker members 106  
15 is in circumferential registry with the corresponding cutter  
16 knives on the knife cylinder 14 by means of a conventional  
17 harmonic drive or differential gear box, as is known. The  
18 registry or phasing may be adjusted by an operator to obtain  
19 desired timing in depressing the trailing edge of each successive  
20 printed product along with timing of entry of the leading edge  
21 onto the headstop nip and adjustment of the surface speed of the  
22 conveyor belts 72.

23           In accordance with another feature of the present  
24 invention, a brake pad, indicated generally at 114, is supported  
25 slightly beneath the path traversed by the printed products as  
26 they traverse the gap into the slower speed conveyor 70. The  
27 brake pad 114 is positioned to generally vertically underlie the  
28 rotational axis of the depressor or kicker wheels 100 and is  
29 adjustable to cooperate with each of the depressor or kicker  
30 members 106 as it depresses the trailing edge of a printed  
31 product so as to sandwich the trailing edge between the kicker  
32 member and the brake pad and apply a frictional deceleration to  
33 the corresponding printed product. This additional deceleration  
34 momentarily imparted to the forwardly moving printed product as  
35 its forward edge enters the headstop nip substantially increases  
36 the rate of deceleration slowing the printed product down to the  
37 substantially slower surface speed of the slower speed conveyor

belts 72, thereby preventing or inhibiting wrinkling or other damage to the printed products.

Referring to FIGS. 6-8, taken in conjunction with FIG. 2, the brake pad 114 is supported in transverse relation to the conveyor path defined by the high and low speed conveyors 50 and 70, respectively, and extends laterally between the upstanding side frame plates 40a and 40b so as to underlie the laterally spaced kicker wheels 100. As illustrated in FIG. 6, the brake pad 114 is supported on the upper surface of a laterally extending support bar 116 which has its opposite ends fixed to slide plates 118a and 118b, both of which are mounted on the inner surfaces of the respective side plates 40a and 40b so as to enable generally vertical movement of the slide plates and thereby the brake pad 114. Each of the slide plates 118a and 118b is pivotally secured to the upper end of a pivot link 120 having its lower end pivotally connected to a rocker arm 122 which in turn is mounted on a transverse pivot shaft 124 extending between and rotatably supported by the upstanding frame plates 40a and 40b. In the illustrated embodiment, the end of the pivot shaft adjacent the side frame 40a extends through the side plate and has a gear 126 mounted in fixed relation thereon. The gear 126 is in meshing relation with a worm gear 128 which is mounted coaxially on a control shaft 130. The shaft 130 is supported by a bracket 132 fixed to the outer surface of the side frame 40a so as to allow rotation of the shaft 130, and thereby the worm gear 128, about its longitudinal axis by means of a handle 134, as illustrated in FIG. 8.

With the brake pad 114 supported for substantially vertical adjustment relative to the outer circular path traversed by the outer ends of the kicker members 106, it will be appreciated that the brake pad may be adjusted to vary the frictional relation between the successive kicker members 106 and the trailing edges of the printed products as their trailing edges are depressed, thereby facilitate shingling and also decelerating the products more quickly to the slower surface speed of the conveyor belts 72.

1           As aforescribed, the knife or cutter blades carried  
2 by the knife cylinder 14 are adjustable about the periphery of  
3 the cutter cylinder so as to cut the printed web 26 to remove any  
4 blanket gap, such as indicated at 30 in FIG. 10, from the lead  
5 end of the press repeat length of the web, and then butt cut the  
6 web transversely, such as at 28, to create a number of equal  
7 length printed products as established by the print cylinders 22a  
8 and 22b during each revolution or press repeat. Alternatively,  
9 the knife blades on the cutter cylinder may be positioned to trim  
10 any blanket gap created in a given press repeat length of printed  
11 web and to cut out any bleed trim between the resulting equal  
12 length printed products within the given press repeat length of  
13 web. As a result of removing the blanket gaps from a press  
14 repeat length of web, the printed products cut from the printed  
15 web will be equally spaced as they leave the knife cylinder  
16 except for the spacing between the trailing edge of the last  
17 printed product of a press repeat length of web and the leading  
18 edge of first printed product of the next repeat length of web.  
19 The decelerating arrangement established by the depressor or  
20 kicker wheels 100 and brake pad 114 of the present invention  
21 compensates for any uneven spacing between successive printed  
22 products conveyed from the high speed conveyor 50 to the slower  
23 speed conveyor 70 by spacing the depressor or kicker members  
24 about the kicker wheel in angularly positions corresponding to  
25 the knife blades on the knife cylinder which establish the  
26 trailing edges of each successive printed products formed from  
27 the printed web.

28           By spacing the depressor or kicker brushes 106 about  
29 the circumference of the kicker wheels 100 in corresponding  
30 angular relation to the knife blades on the rotary cutter which  
31 establish the trailing edges of successive printed products, the  
32 depressor or kicker brush on the depressor wheel which  
33 corresponds to the last-to-cut knife blade on the rotary cutter  
34 will momentarily engage and depress the trailing edge of the  
35 corresponding printed product as its leading edge enters the  
36 headstop nip of the slower belt conveyor to enable the leading  
37 edge of the next succeeding printed product to pass over the

1 depressed trailing edge and effect shingling. Simultaneously  
2 this kicker brush will cooperate with the brake pad 114 to  
3 decelerate the corresponding printed product to a speed close to  
4 the surface speed of the conveyor belts of the slower belt  
5 conveyor. In this manner, successive printed products are caused  
6 to shingle and decelerate irrespective of unequal spacing between  
7 the conveyed printed products due to removal of dissimilar size  
8 transverse scrap or blanket gaps or non-image waste strips  
9 between individual printed products.

10 While a preferred embodiment of the present invention  
11 has been illustrated and described, it will be understood to  
12 those skilled in the art that changes and modifications may be  
13 made therein without departing from the invention in its broader  
14 aspects. Various features of the invention are defined in the  
15 following claims.

What is claimed is:

1                   1.    A method of shingling successive products cut from  
2   a longitudinally moving substantially continuous web of the  
3   product so as to create, within a given longitudinal length of  
4   the web, a plurality of products having longitudinal lengths  
5   which cumulatively add up to less than the given longitudinal  
6   length of web, and wherein the successive products are conveyed  
7   in spaced relation along a first path at a first longitudinal  
8   speed and thereafter conveyed along a second path at a second  
9   longitudinal speed less than the first longitudinal speed, said  
10 method comprising the steps of:

11                       depressing the trailing edge of each successive  
12 product after it leaves said first path so as to enable the  
13 leading edge of the next successive product to pass above the  
14 depressed trailing edge, and

15                       substantially simultaneously engaging the  
16 depressed trailing edge of each successive product with a brake  
17 pad so as to decelerate each product as it enters the second  
18 path.

19                   2.    The method of claim 1 wherein the products are cut  
20 from the web by a rotary cutter having a plurality of cutter  
21 blades disposed in circumferentially spaced relation about an  
22 axis of rotation of the rotary cutter, said step of depressing  
23 the trailing edge of each successive product comprising engaging  
24 the trailing edge with a discrete depressor member carried on a  
25 wheel rotatable about an axis parallel to the rotational axis of  
26 the rotary cutter, said wheel carrying a plurality of depressor  
27 members spaced about the wheel in circumferentially spaced  
28 relation equal to the circumferential spacing of selected ones  
29 of the cutter blades on the rotary cutter, and said wheel being  
30 rotated so that each depressor member will actively engage and  
31 depress the trailing edge of a product cut by a cutter blade  
32 carried on the rotary cutter at the same angular position as the  
33 active depressor member.



1           3. The method of claim 2 wherein said step of  
2 engaging the depressed trailing edge of each successive product  
3 comprises positioning a brake pad at a position wherein each  
4 depressed trailing edge will be engaged by the brake pad to  
5 frictionally decelerate the product.

1           4. The method of claim 3 wherein said depressor  
2 members comprise brushes carried by said wheel in circumferential  
3 spaced relation about said wheel, each said brush having  
4 generally radially directed bristles operative to engage the  
5 upper surface of the trailing edge of a product entering said  
6 second path so as to depress the trailing edge against the brake  
7 pad.

1           5. The method of claim 4 wherein said cutter blades  
2 on said rotary cutter have outer cutting edges lying on a first  
3 circle concentric to the axis of rotation of said rotary cutter,  
4 said brushes having outer tips lying on a second circle having  
5 a diameter substantially equal to the diameter of the printing  
6 plate cylinder.

1           6. The method of claim 4 wherein said brake pad is  
2 adjustable to vary the frictional braking relation applied to  
3 each successive sheet as its trailing edge is depressed against  
4 the brake pad to effect deceleration of the product.

Abstract of the Disclosure

1           An arrangement for decelerating an shingling printed  
2 products as they are conveyed from a variable rotary cutter by  
3 a high-speed belt conveyor to a slower speed belt conveyor  
4 includes at least one depressor wheel at the entry end of the  
5 slower speed conveyor. The depressor wheel carries a plurality  
6 of depressor members in circumferential positions corresponding  
7 to the circumferential positions of cutting knives on the rotary  
8 cutter. The leading edge of each printed product entering the  
9 slow speed conveyor enters a headstop nip which reduces the speed  
10 of the entering product while its trailing edge is simultaneously  
11 momentarily depressed by a depressor on the rotating depressor  
12 wheel to enable shingling between successive products. A brake  
13 pad cooperates with the depressors to decelerate the printed  
14 products to a speed close to the surface speed of the slower belt  
15 conveyor. Successive printed products are thus caused to shingle  
16 and decelerate irrespective of unequal spacing between the  
17 conveyed printed products due to removal by the cutter of  
18 dissimilar size transverse blanket gaps or non-image waste  
19 strips.

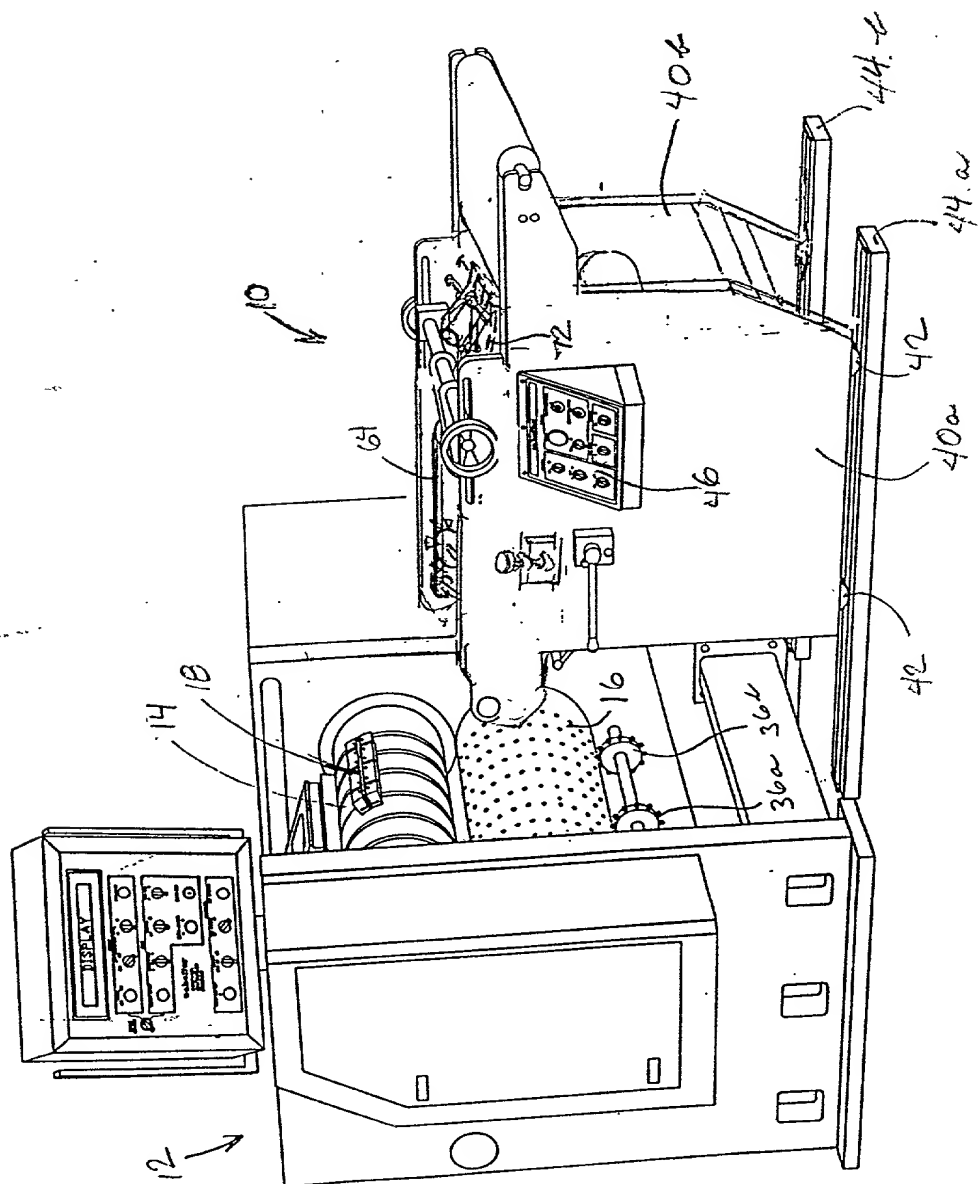
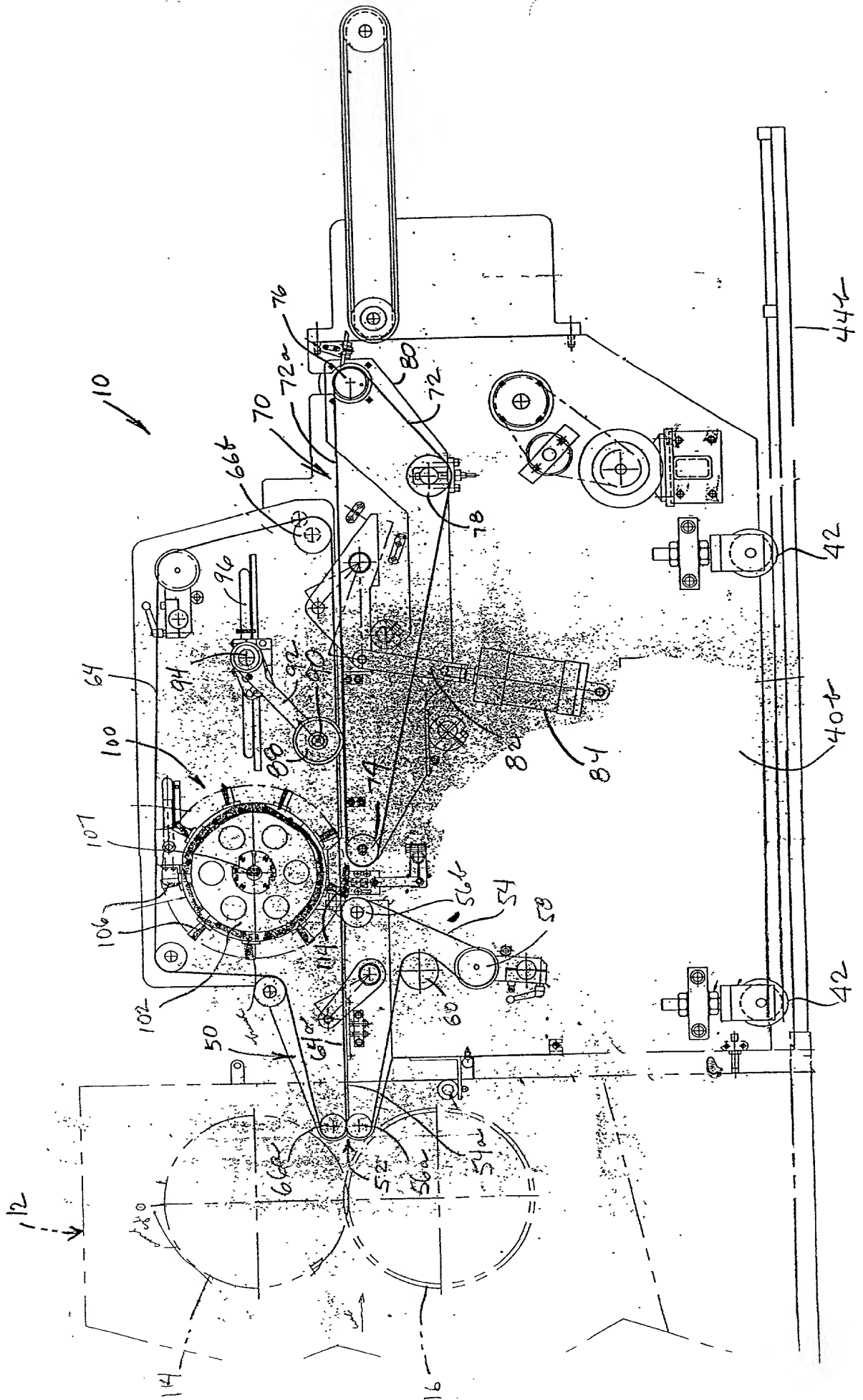


FIG. 1

FIG. 2



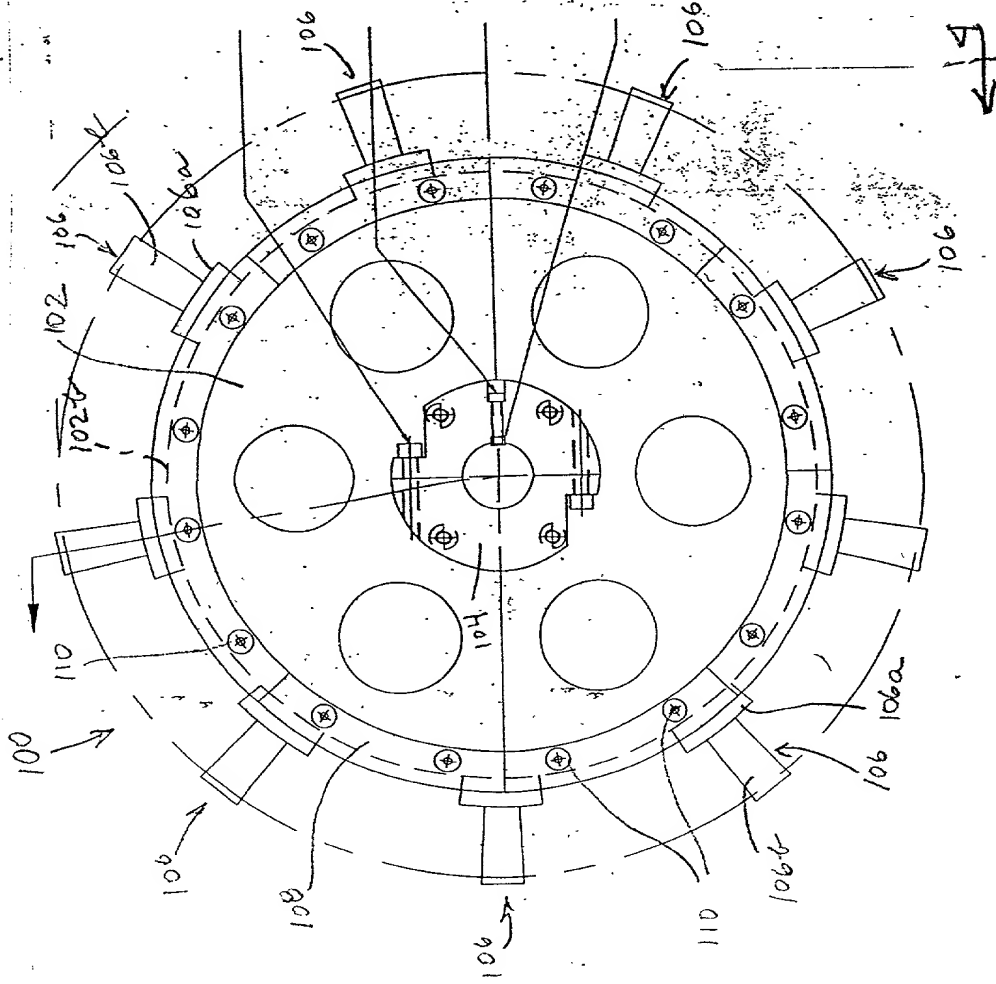


FIG. 3

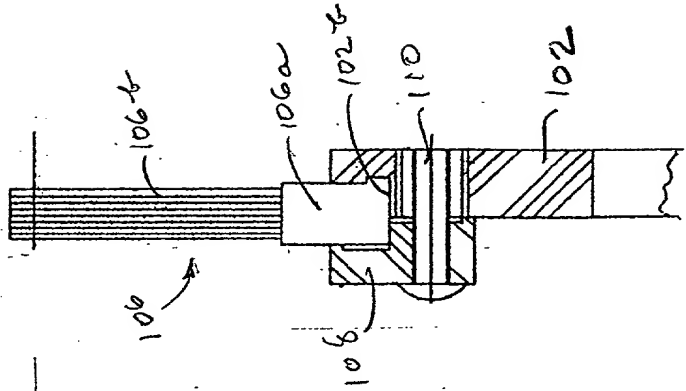


FIG. 5

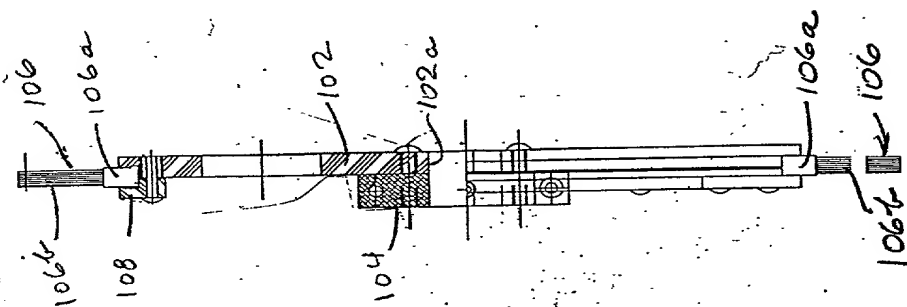
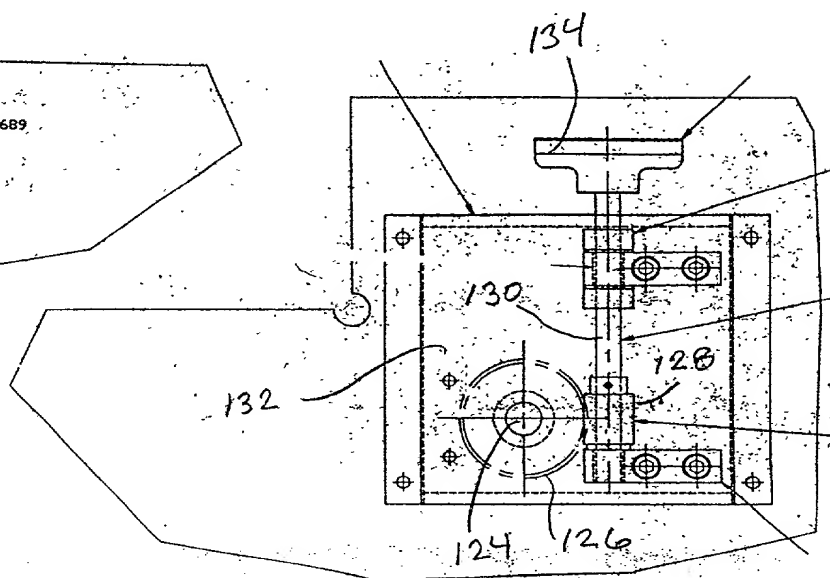
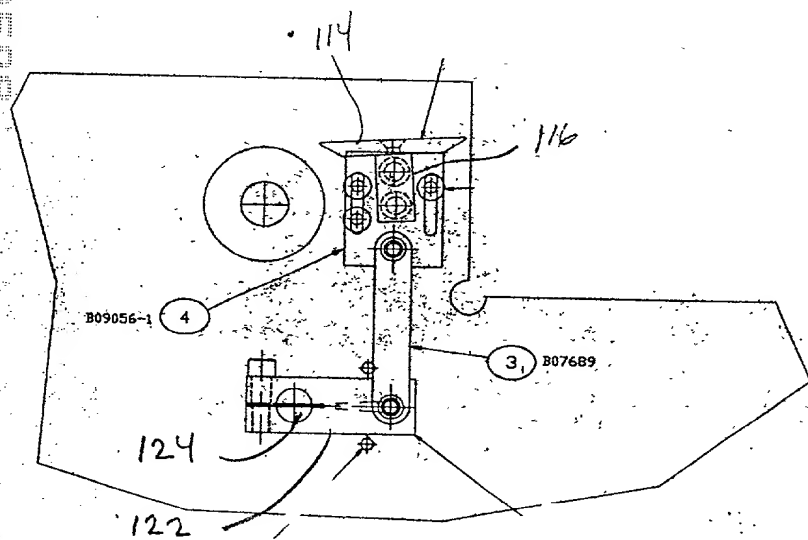
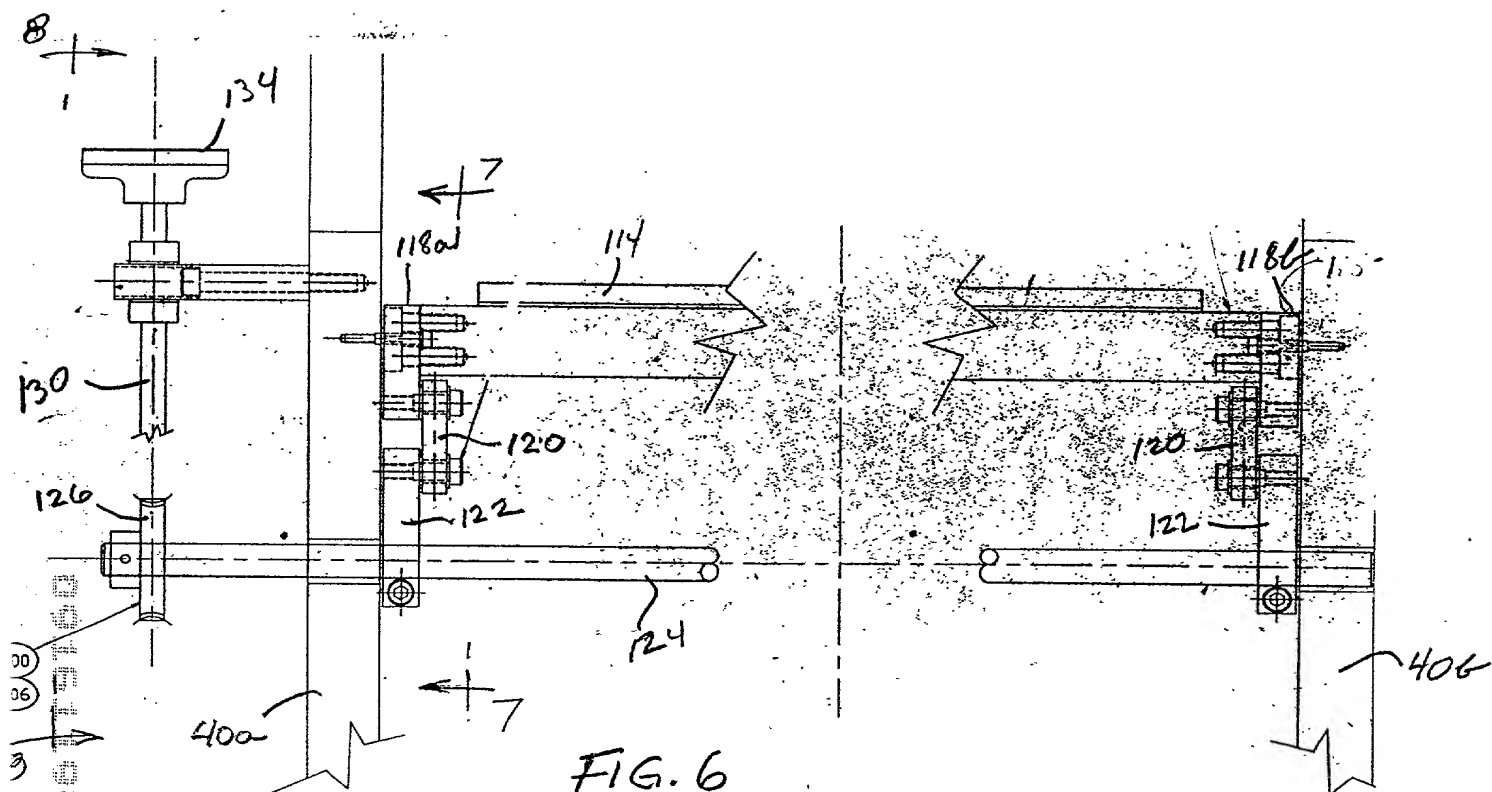


FIG. 4



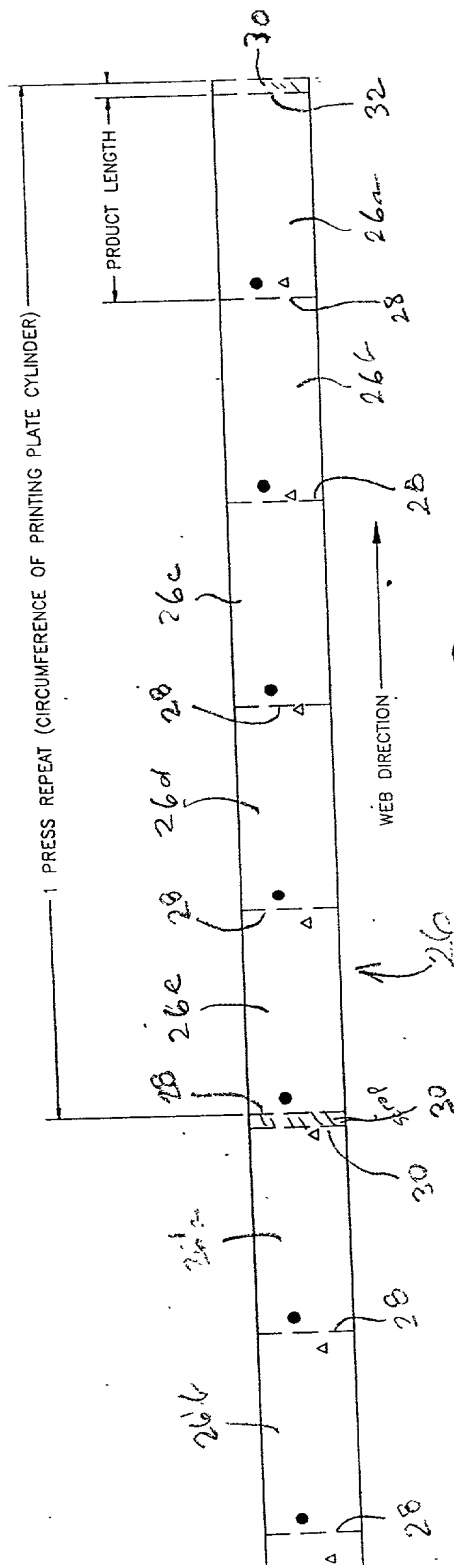


Fig. 9

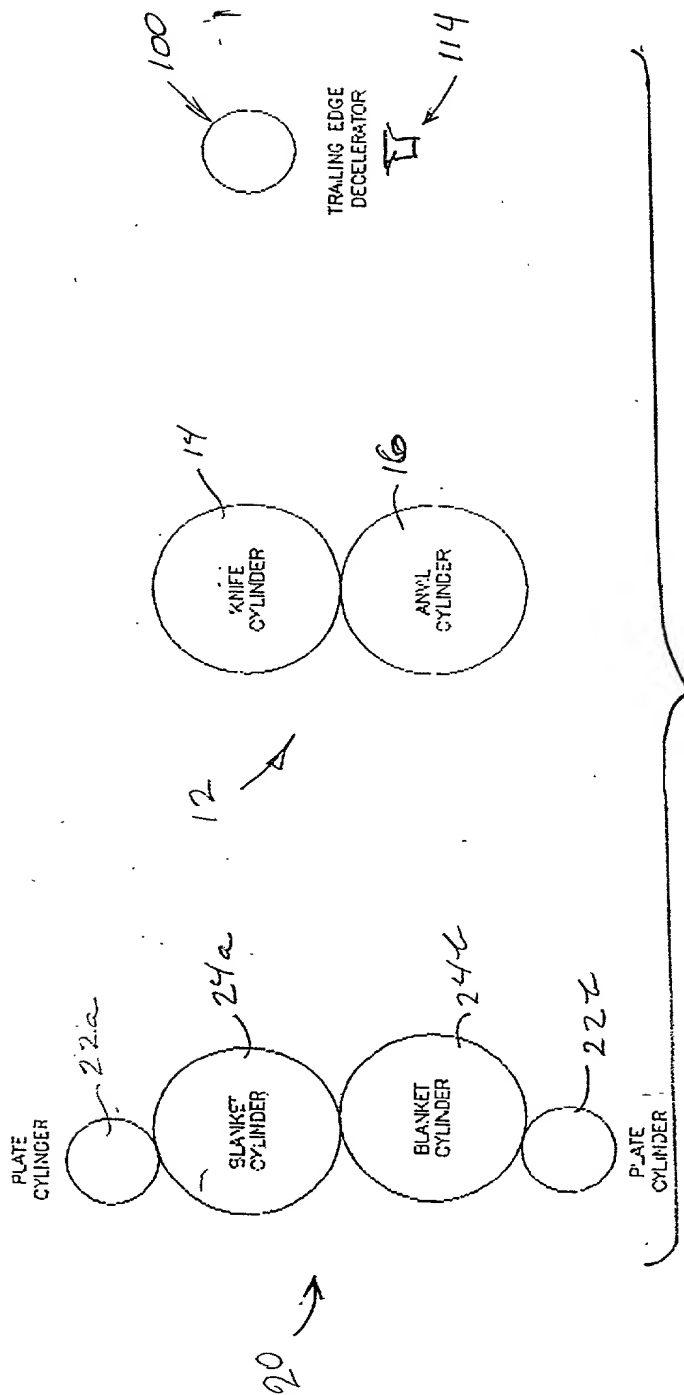


FIG. 10

## DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare:

That my residence, post office address and citizenship are as stated below next to my name.

That I verily believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **DECELERATING MECHANISM FOR PRINTED PRODUCTS**

the specification of which (check one)

- ☒ is attached hereto.
- ☐ was filed on \_\_\_\_\_ as  
Application Serial No. \_\_\_\_\_  
and was amended on \_\_\_\_\_  
(if applicable)

That I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

That I acknowledge the duty to disclose information known to be material to patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

That I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate on this invention having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
			<input type="checkbox"/>	<input type="checkbox"/>
			Yes	No
(Number)	(Country)	(Day/Month/Year Filed)		
			<input type="checkbox"/>	<input type="checkbox"/>
			Yes	No
(Number)	(Country)	(Day/Month/Year Filed)		

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below.

(Application Number)	(Filing Date)
(Application Number)	(Filing Date)

That I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

United States Application(s)

(Application Serial No.)	(Filing Date)	(Status)-(Patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status)-(Patented, pending, abandoned)



That all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

I hereby appoint the following attorneys, with full power of substitution and revocation, to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith and request that all correspondence and telephone calls in respect to this application be directed to WELSH & KATZ, LTD., 135 South LaSalle Street, Chicago, Illinois 60603, Telephone No. (312) 781-9470:

<u>Attorney</u>	<u>Registration No.</u>
Donald L. Welsh	16,665
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Richard L. Wood	22,839
Jerold B. Schnayer	28,903
Eric C. Cohen	27,429
Joseph R. Marcus	25,060
Gerald S. Schur	22,053
Gerald T. Shekleton	27,466
James A. Scheer	29,434
Daniel R. Cherry	29,054
Howard B. Rockman	22,190
Edward P. Gamson	29,381

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joint inventor:

Bruce A. Scheffer

Inventor's signature:

Date:

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Full name of additional  
joint inventor, if any:

Inventor's signature:

Date:

Residence and Post Office Address:

Citizenship:

SECRET

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare:

That my residence, post office address and citizenship are as stated below next to my name.

That I verily believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **DECELERATING MECHANISM FOR PRINTED PRODUCTS**

the specification of which (check one)

- ☐ is attached hereto.
- ☒ was filed on June 29, 1995 as  
Application Serial No. 08/496,822  
and was amended on \_\_\_\_\_  
(if applicable)

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Prior Foreign Application(s)			Priority Claimed	
			<input type="checkbox"/>	<input type="checkbox"/>
			Yes	No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>	<input type="checkbox"/>
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/>	<input type="checkbox"/>
			Yes	No

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below.

_____ (Application Number)	_____ (Filing Date)
_____ (Application Number)	_____ (Filing Date)

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United States Application(s)

_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status)-(Patented, pending, abandoned)
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That all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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Daniel R. Cherry	29,054
Howard B. Rockman	22,190
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Full name of sole or one  
joint inventor:

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Inventor's signature:

*James E. Hoolehan*

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